

# Decreasing the Effective Melting Point of Metals Through Continuous Covalent Bond Disruption and Kinetic Agitation via Injection of Soliton Quintuplet Sets; Wide-Ranging Implications for Modernization of Construction Methods

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## Introduction

Both construction and ore refinement require a great deal of energy which is traditionally expended in the generation of thermal energy used in order to reshape solids into new shapes in support of the formation of construction materials or to facilitate the separation of various elements, respectively. Additive manufacturing shows a great deal of promise for revolutionizing manufacturing, but the requirement for large quantities of heat in order to facilitate the liquefaction of iron and other construction metals renders additive manufacturing impractical in situations in which metals are called for.

Even with the advent of efficient light-to-heat bleaching agent-enabled furnaces and efficient heat recycling, the extreme temperatures required for smelting are often incompatible with additive manufacturing equipment which is prone to melting or damage from the extreme temperatures.

Just as Coulomb Force Lines promise to revolutionize cryo-preservation by effectively increasing the freezing point of materials, soliton energy has application in the area of decreasing the melting point of metals with traditionally high melting points; particularly ferromagnetic metals the properties of which lend themselves to the conversion of intense, rapidly pulsed soliton energy into chaotic kinetic energy and covalent bond disruption at femtosecond timescales; in support of liquefaction of metals such as iron at room temperature.

## Abstract

Unlike CFL-mediated room-temperature freezing, which requires the application of Coulomb Force Lines prior to the application of a chilling process (if one is implemented at all) in order to protect the integrity of living cells whilst preserving them, soliton-mediated room-temperature smelting (SMRTS) can be aided by the pre-heating of materials prior to the engagement of a SMRTS field. Alternatively, stronger soliton waves in rapid succession (1fs between waves) may be used to prime the liquefaction process without any auxiliary thermal heating of a metal bulk whatsoever.

Once liquefied, the strength and pattern of soliton energy used to maintain the liquefied state would change. The first step in the process involves the disruption of covalent electron bonds using the soliton energy; bonds which, although they may be disrupted on femtosecond timescales by a single soliton

wave, are quickly re-established, resulting in metals maintaining their solid structure in the event of interaction with merely intermittent soliton energy. The emission of five or more waves with a temporal spacing of 1fs would be sufficient to break these electron bonds for a sufficient length of time for magnetic forces to become prevalent and for an ultra-rapid gauss/degauss cycle to be used to maintain the agitation of iron atoms in a newly liquefied mass of iron. Physical agitation of the atoms is merely one half of the equation, as it were, unlike in the case of water made to maintain a liquid state by the addition of salts which turbulate water as the result of mutual repulsion of salt molecules and water molecules. In addition to this, we must also preclude the re-establishment of strong covalent bonds, something that requires both more force and more finesse than using salt to prevent water from freezing, given the strength of the forces involved.

Given iron's tendency to retain magnetism, it would be important to ensure that no one portion of the bulk of iron to be liquefied becomes too strongly magnetized or for magnetic conditions to remain stable in any one area for an excessive length of time (more than a microsecond.) In support of these objectives, spherical casks may be used to allow for soliton energy to directed toward the liquefied mass from varying directions in rapid succession with offset timings, the physical shape of the cask and the offset timings serving to prevent pockets of the bulk from re-solidifying as a result of magnetic alignments; magnetic chaos being required in order to preclude the re-establishment of covalent electron bonds between iron atoms.

Such a mechanism as well as the iron bulk itself would generate a phenomenal level of electromagnetic interference, requiring electromagnetic shielding be utilized in order to ensure FCC compliance. There would be electrical energy requirements that, although non-trivial, would be far less than the energy required in order to thermally melt iron.

Upon the extrusion of the iron liquefied through the SMRTS process, the iron would re-solidify nearly instantaneously and in some cases, more quickly than is desired. Advantageously, this rapid re-solidification would lead to the formation of nanostructures that make overall structures far stronger than would otherwise be possible whilst simultaneously reducing the cost of manufacturing iron-based structures. This would not be limited to building construction but would include such structures as the hulls of surface ships and submarines.

## **Conclusion**

For ship construction, for example, rather than large metal sections of hull being produced at sites miles away, mobile SMRTS units could be used to enable the additive layering of metals at the integration site.

For ore refinement, SMRTS is a logical approach given that the ability to render metals into a liquid at room temperature in sandy mediums which would be allowed to remain in a solid state as the result of the use of this alternative

process would enable rare earth element separation from bulk extracted earth with an unprecedented level of efficiency.